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# IT Service Desk Process Improvement – A Narrative Style Case Study

Atul Arora
*Queensland University of Technology*, a2.arora@student.qut.edu.au

Wasana Bandara
*Queensland University of Technology*, bandara@qut.edu.au

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Atul Arora
Queensland University of Technology
a2.arora@student.qut.edu.au

Wasana Bandara
Queensland University of Technology
w.bandara@qut.edu.au

**Abstract**

*This paper is a detailed case narrative on how a Faculty of a leading Australian University conducted a rigorous process improvement project, applying fundamental Business Process Management (BPM) concepts. The key goal was to increase the efficiency of the faculty's service desk. The decrease of available funds due to reducing student numbers and the ever increasing costs associated with service desk prompted this project. The outcomes of the project presented a set of recommendations which leads to organizational innovation having information technology as an enabler for change. The target audience includes general BPM practitioners or academics who are interested in BPM related case studies, and specific organisations who might be interested in conducting BPM within their service desk processes.*

**Keywords:** Business Process Management, Service Desk, Help desk, Information Technology Infrastructure Library (ITIL)

## 1. Introduction

*"It is widely reported that organisations are increasingly dynamic as they seek to rationalize, innovate and adapt to changing circumstances"* (Kueng and Kawaleyk 1997 pp.1) External factors are one of the major reasons for organisations to undergo process change in terms of their delivery of products and services to customers (Hammer and Champy 1993). The main objective in most companies is to provide high quality products and services, in a rapidly changing environment, with minimal cost and time (Davenport 1993).Universities, like any other organisation, are also affected by external factors. For example, the type of jobs that are in demand, in relation to a particular discipline of study, will impact the volume of student enrolments which in turn contributes to the flow of available funds to run the different divisions within the university. Following the economic recession during 1999-2002 (Wolfers J. 2002) there was a recorded number of jobs reduced within some disciplines. With the objective to minimise cost and provide effective services, Universities have to undergo various reforms to engineer their processes. This paper presents a narrative of how a Faculty within a leading Australian University re-engineered its Service Desk processes to fulfil the goal of providing more efficient and effective Service Desk services to its students and staff. The paper will first introduce the case organisation, and will then provide an overview of the project background. The narrative then proceeds to discuss the current situation of the processes

under investigation and summarises the different business process improvements techniques applied within the project. Finally, the paper concludes with an overview on the proposed recommendations.

## 2. The Case Organisation

The case organisation described herein is the Faculty of Information Technology (FIT), Queensland University of Technology (QUT), Australia. QUT is one of the leading universities of Australia running over 8 Faculties on its three campuses, Gardens Point, Kelvin Grove and Carseldine and enrolling more than 40,000 students; both domestic and international (QUT 2005) . *"QUT's Faculty of Information Technology is an established leader in high-quality degree programs and research for the IT profession"* (FIT 2005) . It accounts for enrolling more than 3000 full time under-graduate and post-graduate students (including research based students). FIT provides its education services under two schools, School of Information Systems (IS) and School of Software Engineering and Data Communications (SEDC). Within the organisational units under FIT, Technical Service Section (TSS) is accountable for providing the IT infrastructural services to FIT. TSS is sub-divided into of five teams on the basis of the activities performed by them. The teams and their activities are depicted in Table 1.

| Teams | Activities |
|---|---|
| Desktop Support Team | ▪ Software application installation<br>▪ Service accessibility, email, computer logins and password related problems.<br>▪ Innovation and R&D<br>▪ FIT staff development and training |
| Server Support Team | ▪ Networking support<br>▪ Standard operating environment (SOE) management<br>▪ Innovation and R&D |
| Information System Team | ▪ FIT Student Information System (FITSIS) support<br>▪ Online Assessment System (OAS) support<br>▪ Online Exam System (OES) support<br>▪ General Web development and business applications support |
| Infrastructure Support Team | ▪ Asset management<br>▪ Infrastructure development |
| Front Line Team (FLT) | ▪ Supportive services for above four teams<br>▪ Student assignment Submission / return handling<br>▪ Resolving basic technical problems<br>▪ Point of contact for students and staff<br>▪ Software loaning for staff and students |

Table 1 – TSS teams and their activities

## 3. Project Background

### *3.1 The Current Situation*

During the late 1990's there was a surge in demand for IT courses. However, when the "technology bubble" (The Dot Com era) busted (Crabtree S. 2003), the demand for workforce related to IT was dropped (Sargent J. 2004); thereby the demand for IT courses plummeted in universities. The FIT's income is primarily derived from the number of full time equivalent students enrolled within the faculty. Reductions in the number of full time students (including research based students) resulted in a drop of income received, which in turn caused the faculty to seek for any means of cost cutting, to maintain financial feasibility of the department. As of 2005, the total student numbers have dropped significantly (a 65% drop in comparison to the statistics of its peak level in 2001). As a response to this issue, the FIT has undergone a number of reforms to restructure the faculty and thus reduce expenditure. The Incident Management process - performed by the Service Desk (IT Help Desk) of the TSS were

identified as one of the candidates for potential cost savings. Today, when organisations perform its core processes, they are more dependent on IT enabled services. Apart from the cost of implementing the IT infrastructure, a significant part of the cost for supporting the infrastructure remains the major expense to organisations (Office of Government Commerce 2003). Organisations often conduct their IT support processes through an IT Help Desk, operated either by the organisation itself or outsourced to another professional entity. Within the Help Desk environment, a Service Desk is a single point of contact for end users who seek IT related assistance. An Incident Management process is regarded as a major function within a Service Desk environment which enables the organisation to detect incidents and resolve them as soon as possible. As defined by the Information Technology Infrastructure Library (ITIL)[2], *"An incident is any event which is not part of the standard operation of a service and which causes, or may cause an interruption to or a reduction in the quality of that service*" (Office of Government Commerce 2003).

### *3.2 Selected focus for this project*

The Technical Service Section, of FIT, QUT, provides infrastructural services to the faculty, and forms a critical element within the faculty's infrastructure. The academics and students will have difficulty to perform their day to day tasks, without adequate support that this team provides. Nevertheless, this division was identified as a potential candidate for process improvement, especially in relation to labour related cost savings and improved efficiency. A process improvement project was initiated by FIT in August 2005, with the aim of analysing this process. The main objectives of the project were to:

1. move away from the current informal method of completing Service Desk jobs, to a consistent means of managing them,
2. implement and align processes with the QUT-ITIL model[3]; using the QUT IT Service Management Reference Guide as a best practice procedure manual,
3. improve the Service Desk operation so that 100 % of the time, the incidents are within the threshold limits towards its resolution,
4. reduce the occurrence of incidents being mismanaged, and
5. change from informal problem management to a formal problem management process.

[2]ITIL (Information Technology Infrastructure Library) is a process-based methodology that delivers a set of IT Service Management best practices that can help organisations align their IT with their business requirements, improve service quality, and lower the long-term cost of IT service provision. (Office of Government Commerce. 2003).

[3] QUT has adapted its own version of best practices (titled; IT Service Management model) based on the ITIL reference model. It is the strategic intent of QUT to implement this model at a university wide level across all its Faculties. The QUT-ITIL project reviewed the ITIL standard process and created a version that better suited university needs.

The main strategic intent was to reduce cost, yet provide efficient (at least the same level of) service to FIT students and staff. This project was scoped to understand and analyse the Incident Management process of Service Desk and recommend solutions which will facilitate the process change. The next section will describe the As-Is process flows and related issues of the selected project scope.

### *3.3 The As-Is process descriptions*

The incident management process is consisted of five distinct processes: incident reporting, acknowledgement, respondance, resolving and closure processes. Exhibit 1 presents a conceptual overview of the flow of these processes. A glossary of terms is provided in Appendix A to introduce and define the key terms used in the process descriptions and process work flow diagram.

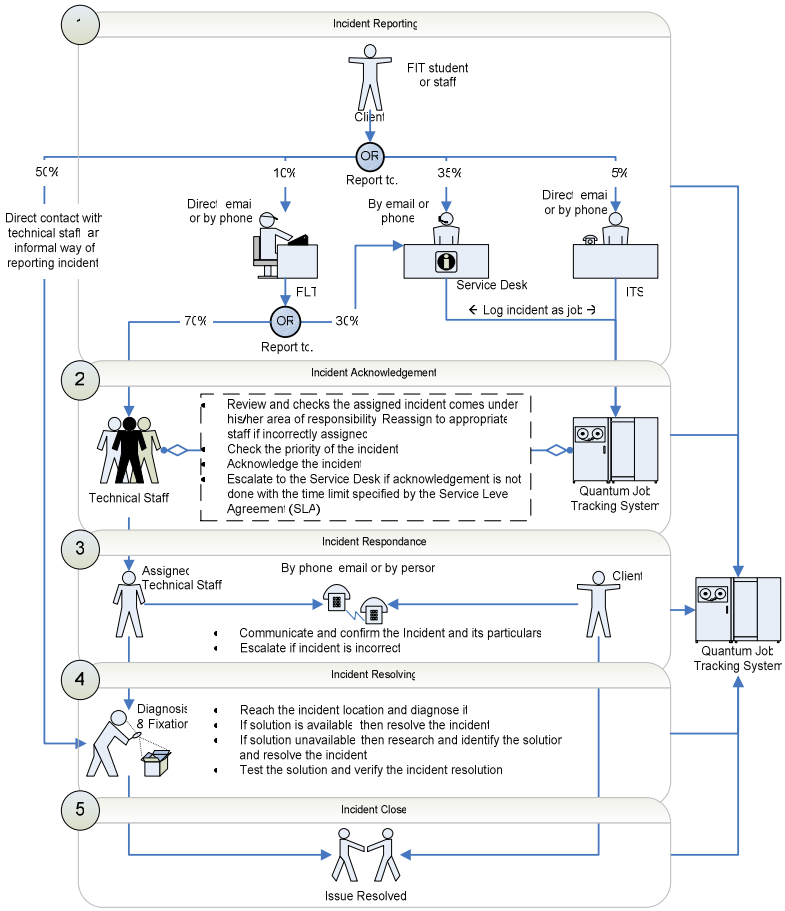


**Exhibit 1: Overview of IT Incident Management process flow**

### *3.4 The AS-IS Issues Analysis*

Exhibit 2 provides the summary of the issues identified. The issues identified within each process are listed and analysed using the project methodology and techniques applied in the analysis phase. These techniques are described in detail in Section 4.0 of this paper.

| | |
|---|---|
| **Incident Reporting** | |
| 1. No recording of minor issues | 7. Informal incident notification method |
| 2. Misleading classification of incidents | 8. Incomplete information of incidents |
| 3. Incorrect incident prioritisation method | 9. Ad hoc basis, for assignment of Incident |
| 4. Informal incident notification method | 10. No recording of minor issues |
| 5. Only 30% of the total number of incidents are recorded | 11. No matching of incidents to potential problems |
| 6. No record internally detected incidents | |
| **Incident Acknowledgement** | |
| 1. No update of acknowledgement status | 3. Incorrect assignment of incident |
| 2. No regular checks of incident in QUNATUM. | |
| **Incident Respond** | |
| 1. Inconsistent means of contacting the client | 4. Late scheduling done by technical staff |
| 2. Abandoned incidents are left open in the system | 5. Reassignment of incident is done on ad hoc basis. |
| 3. Insufficient incident and client contact details | 6. Inconsistent means of changing the incidents purpose |
| **Incident Resolution** | |
| 1. No handover system of incident allocated to unavailable support staff | 3. Minor incident are handled by specialised technical staff |
| 2. No update of the progress the system | 4. No client reporting during delays |
| **Incident Close** | |
| 1. Incidents are left open | |

**Exhibit 2 – Issue Analysis**

## 4. Project Methodology and Applied Techniques

This business process improvement initiative employed a combination of techniques to achieve its improvement goals. Overall, the entire business process improvement efforts were conducted following the **'Business Process Life Cycle'** framework (Rosemann 2001). The 'modelling' and 'analysis' activities (which were the core phases of the overall methodology applied), were supported and conducted using the **ARIS tool set and its embedded eEPC modelling methodology**. The **'Guidelines for Modelling (GoM)'** framework (Becker et. al. 1997) was used to guide model development. A **Task group** was conducted to elicit information to

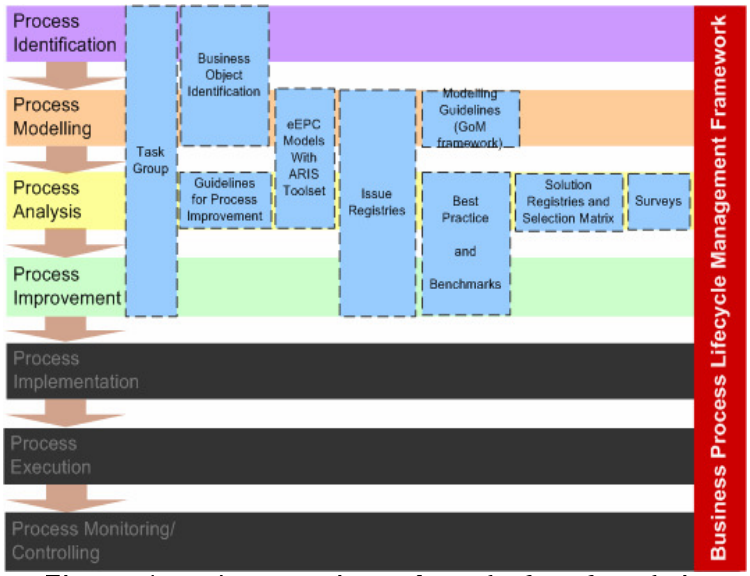


**Figure 1 – An overview of method and techniques**

derive the 'As-Is' process models. These Task groups also supported the elicitation and categorization of issues identified earlier. The elicited issues were synthesized within continuously evolving **issues registries**, which supported the decision making process (i.e. prioritization) for the 'To-Be' recommendations. A comprehensive search on **best practices** was also conducted within the analysis phase. On the basis of that, benchmarks were identified for the 'To-Be' phase to identify and justify potential recommendations for the processes under investigation. During the analysis phase, numerous solutions for process improvements were identified on the basis of **guidelines for process improvement** (Rosemann 2001) and a **solution priority method** which was developed to facilitate the solution selection for the improvement phase. Figure 1 depicts how all these different techniques and approaches 'fit' together forming an overall approach. The following section will briefly introduce each of these in brief detail.

### *4.1 The Business Process Lifecycle Management Framework*

Rosemann (2001, p.2) describes the attempts of process improvement and process engineering as *"[...] a holistic approach for managing the entire process lifecycle*" which consists of several different steps. The process lifecycle should be followed to facilitate the changes for process improvement. *The Process Lifecycle* referred to in this paper, contains seven steps. As Figure 1 indicates, this narrative reports only up to the first four phases[4], due to the Business Process Management design (and not implementation) perspective of the project scope. The goal of this first phase; *process identification*, is to identify the process which is required to be improved or needs to be changed. Another sub task of this phase is to identify and name the sub-processes which consist of the overall process. A Value Added Chain (VAC)[5] diagram was derived for this purpose (which comprised of five sub processes - as described in Exhibit 1), which was validated by interviewing the head person of TSS.The next step; *As-Is process modelling,* was to describe and model all the contents of each sub process in detail. Key elements to note from this phase were: (a) the clearly defined objectives for modelling; (b) the use of an appropriate tool; (c) the use of an appropriate technique/ language; (d) having a documented set of modelling conventions[6]; and (e) having a proper strategy to collect appropriate information for deriving the models (i.e. task groups, interviews, and other levels of access to data). The objective of the *process analysis* phase, is to "*[…] identify the objectives of the process and list current shortcomings*" (Rosemann 2001, p 12). The analysis was split into three areas. a) **Process Analysis** of the current 'As-Is' models and identified issues. Solutions were discovered and selected using the solution selection method. Feedback was received from the client in order to confirm the proposed solution priorities; b) An **ITIL analysis** was performed (through the ITIL self assessment model developed by QUT) to understand how well TSS conformed to the processes defined by QUT. The QUT ITIL process standard was reviewed for improvements that could result in immediate changes to resolve issues identified in the process analysis thus far. And finally, (c) **The service analysis** looked at how the current services were provided within

[4] The first four phases of this framework are focused on the design of the Business Process Management Solution where the last three phases are focused on the implementation of the solutions.
[5] A Value Added Chain represents the sequence of sub-processes which are involved in the process in context.
[6] Layout conventions, model naming conventions, symbols type and naming conventions.

FIT, and what services could be provided externally. The service analysis included looking at the structures within the TSS team and its service demands. During the *process improvement* phase, the selected solutions were researched, effective benchmarks were identified and lists of steps/requirements were presented to the client for the achievement of the desired improvement results.

### *4.2 Task Group*

The task group was formed which provided the input, guidance and direction to the project team and, discuss and finalise each phase of the project. The group comprised of three project team members, two mentors and the client (including the key process owners). The team was responsible for carrying out all the project activities from the beginning till the end. The mentors were responsible for providing guidance and support for carrying out the activities. The client and key process owners were responsible for primary input for deriving the process models and identifying the core issues within the existing processes.

### *4.3 eEPC modelling technique with ARIS toolset*

The eEPC process modelling technique, derived by IDS Scheer AG (Sousa et al. 2002) has been used to model the 'As-Is' process for this project by using the ARIS Toolset. Event Driven Process Chain (EPC) models illustrate a process in terms of an alternating and procedural sequence of Events (state) and Functions (activities) (Davis 2001). An e-EPC extends the basic EPC by presenting additional information related to the process, such as: process participants in terms of organisational elements; and process data and information systems. These eEPC models provided; (a) a generic view of the processes. Therefore, a conceptual schema or design (independent to specific implementation technologies) of the IT Incident Management process was easily presented, (b) the models also enabled the depiction of a high level view of the IT Incident Management process in a way that can be easily understood by multiple stakeholders; (c) the technique enabled to depict resource utilisation and time requirements in the flow of tasks within the processes, thus, adding valuable insights to the process analysis phase. The ARIS tool set[7] was used to derive, distribute and maintain all process models related to this project. ARIS stands for "Architecture of Integrated Information Systems". This tool has been recognised as the global market leader among Business Process Management tools (Gartner 2005).

### *4.4 Issues Registries*

An issues registry is a log of all the issues identified during the project. The elements of an issue register include: the issue itself; description about the issue; their consequence; impact of the issue (on a scale of high, medium or low); the type of issue (i.e. whether it was organisational, technological or process related); any solution that can be thought of or suggested by the client or anyone; and any related project which is going on so that the effect can be analysed on other projects.

[7] ARIS software offers an integrated and complete tool portfolio for strategy, design, implementation and controlling of business processes.

### *4.5 Best practice and Benchmark identification*

'Best practice' research, generally entails the search for other examples of how things are done better. This can be done by collecting qualitative and quantitative information (known as 'benchmarks') about related or similar processes to the one under investigation. Within this project, the Faculty of Science, QUT was used as a Best Practice reference as they had undergone a process change project of their Service Desk area and proved to be beneficial. 'Reference models'[8] are another way to capture information about best practice. One such Reference model that was applied within this project was the QUT - ITIL model.

### *4.6 Surveys (and interviews)*

A survey was used during the process analysis phase to identify the possible issues and concerns from clients and TSS staff. The survey was conducted with 20 TSS staff, 20 students and 30 academic staff. Different questions were posed to the different cohorts. The survey had two phases; one phase was conducted prior to the initialisation of process analysis to understand the constraints and limitations. The second phase was conducted to analyse the perceptions of the suggested solution(s) from the client.

### *4.7 Guidelines of Modelling (GoM) framework*

The aim of the Guidelines of Modelling (GoM) framework is the development of specific model design recommendations. Its application increases the quality of models beyond the fulfilment of mere syntactic rules (Becker et al. 1997). Some of the guidelines considered for this project based on the GoM framework were: 'Correctness'- to presents the right process; 'Relevance'- of the model elements and relationship; 'Efficiency'- information presented through model should be 80% correct; 'Clarity'- easily to understand; and 'Consistency'- all models must adhere to the derived modelling conventions.

### *4.8 Guidelines for Process Improvement*

The Guidelines of process improvement provide alternative ideas and identify possible opportunities for process improvement by three distinct perspectives. These are improvements related to (a) specific *outcomes* of a process; (b) *flow of activities* of a process, and (c) *resources involved* in a process (Rosemann 2001, p 15). A process improvement checklist was created based on Rosemann's framework. This check list was used to brainstorm any improvement ideas for each particular process. This was structured as a tabular form containing the areas of process improvement, their relevance as per the scope of the project and the improvement alternatives categorized into short term, medium term and long term solutions.

### *4.9 Solution Selection Method*

In order to facilitate solution creativity and discovery of top priority solutions a Solution Selection Method was developed and used. The method comprised of the following steps:

***Solution Strength*** =
*(Cost of issue)* * *(frequency of issue)* + *(cost of solution)* * *(time to implement solution)*

***Relative Solution Strength*** =
$\sum$*(Solution Strengths for all Issues solved by a particular solution)*

[8] "A reference model serves as a model for generally valid documentation of best practice" (Becker et al 2003).

a) Solution identification and summarization: numbers of solutions were identified with regards to the mitigation of each issue and were summarised in a *Solutions Register*. Each solution was categorized into two important elements. First, the timeframe for its implementation (as either Short or Long term solutions). This allowed each solution to be weighed according to its ability to provide a "quick win". Second, the key assumptions which allowed the client to weigh their organisation's ability to practically implement the solutions suggested.

Figure 2 – Solution Strength

b) Solution Strength identification: a Solution Strength formula was developed (Figure 2) in order to ensure the result of this formula presented a solution which met the "limited budget" criteria. A weighting score[9] was allocated to each variable.
c) Solution Selection - It was observed that one solution may solve more than one issue. As a result, a Relative Solution Strength (RSS), for each solution was calculated and mapped onto a Process Solutions versus Issues Cross Matrix (see Figure 2). These solutions were then compared against the issues they solved to assign a relative priority.

## 5. Recommendations (To-Be)

[9] Issue cost: 1 (negligible) to 4 (Major) and Issue Frequency: 1 (never) to 5 (all the time) ; Solution cost: 4 (negligible) to 1 (Major) and time to implement solution: 3 (Short Term) to 1 (Long Term)

Table 2 – Proposed Recommendations

| Recommendations | Descriptions | Solution Fit | Benefits / Objectives met | Area of improvement |
|---|---|---|---|---|
| **Front Line Team (FLT) Closure** | The **FLT closure** recommendation looked at redistributing the FLT services to Information Technology Services (ITS), as there was a lot of overlap with the services provided by FLT and the central ITS division. This was also recommended by the science faculty of QUT, which was used as a benchmark for this project. | Transfer of Front Desk Service which is mainly concentrated to deal with students, to the ITS department. | • An amount of AUD$ 150,000 per year was estimated as a net benefit from this solution.<br>• Direct benefit of reduction FLT staff member annual salaries)<br>• Additional benefits of maintaining the FLT section and facilities | Organisation |
| **Client Self Service** | The **Client Self Service** incident reporting interface is a web based application which will allow the academic staff to log and review their incidents online. | Supplementing the gap (of services provided by the FLT) created by the closure of FLT and reinforces its closure. Both solutions will enable FIT to reduce cost and maintain the same level of services. | • Incident reporting can be done by the client directly<br>• Reduced process inefficiency with incident reporting process. | Technology |
| **Knowledge Base System** | The **Knowledge base system** will extend the use of client self service, whereby an academic staff will be able to lookup for a solution regarding the incident through an online solution repository. | | • Minor incidents can be fixed by client itself<br>• Workaround for solution will be easily available<br>• 81% of the incident will be solved at the first level of support. | Technology |
| **QUT - ITIL Compliance** | The **QUT-ITIL Compliance** improvement looks at improving the service management within FIT allowing for potential savings and definite improvements to the alignment of the IT Service Support to the business needs. | Will provide a process which will act as a base to facilitate the integration of services between FIT and ITS. Also, provide the base for achieving the above three recommendations. | • Improved quality of service<br>• A best practice compliant IT Incident management process<br>• Reduced impact on business<br>• Consistency of processes with QUT, which allows for usage of university wide services | Process |

With the utilisation of the Solution Selection Method, four solutions were identified as recommended solutions. These are described in summary in Table 2.

## 6. Conclusions

This paper documented a detailed case narrative on a business process improvement project that was conducted at a leading Australian University. The case narrative is rich and hence can be designed as a flexible tool for effective experimental learning within a related domain. The outcomes of the project presented how an organizational change can be achieved by using information technology as an enabler to facilitate the change. Overall, the learning provided from this case study as a vivid depiction of how a combination of modern BPM concepts and analytical methods can be applied within a single BPM initiative to achieve both IT and organisational objectives.

## 7. Acknowledgements

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## Appendix A- Glossary

- **BPM** – Business Process Management.
- **FIT** – Faculty of Information technology, QUT.
- **FLT** (Front Line Team) - A service counter establish by TSS to handle and assist all the outside activity of TSS
- **IS** – Information Systems
- **IT** – Information Technology
- **ITIL** – Information Technology Infrastructure Library
- **ITS** (Information Technology Services) - A QUT department which provides IT related services to QUT. In addition, ITS provides a valued IT helpdesk to assist QUT staff and an information centre to answer enquiries from those external to the University. (ITS 2006)
- **QUT** – Queensland University of Technology.
- **QUT ITIL** – A reference model based on the ITIL model developed by QUT. This model is the strategic move for all the service desk within each faculties of QUT.
- **QUANTUM** – Job (incident) tracking system used by FIT Service Desk.[10]
- **SEDC** – Software Engineering and Data Communications
- **TSS** (Technical Services Section) – An organizational unit comes under FIT which is accountable for providing the IT infrastructural services to FIT including the student computing laboratories, assignment tracking system and Help Desk support to FIT students and staff

[10] For more information got www.quantum.com